

ABSTRACT

A method for the ligation of expressed proteins which utilizes inteins, for example the RIR1 intein from *Methanobacterium thermotrophicum*, is provided. Constructs of the *Mth* RIR1 intein in which either the C-terminal asparagine or N-terminal cysteine of the intein are replaced with alanine enable the facile isolation of a protein with a specified N-terminal, for example, cysteine for use in the fusion of two or more expressed proteins. The method involves the steps of generating a C-terminal thioester-tagged target protein and a second target protein having a specified N-terminal via inteins, such as the modified *Mth* RIR1 intein, and ligating these proteins. A similar method for producing a cyclic or polymerized protein is provided. Modified inteins engineered to cleave at their C-terminus or N-terminus, respectively, and DNA and plasmids encoding these modified inteins are also provided.